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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,663	01/20/2004	Daniel Sabatino	67,097-018; EH-10933	1079

26096 7590 11/09/2006

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ART UNIT	**PAPER NUMBER**
3746	

DATE MAILED: 11/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/760,663	SABATINO ET AL.
	Examiner	Art Unit
	Ted Kim	3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 11/02/2005.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 11-36 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 11-36 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 7/31/06.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 07/31/2006 has been entered.

Claim Objections

2. Claim 33 is objected to because of the following informalities: "communicate" should be –communicated--. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 11-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Huang (2004/0194627). Huang teaches a method of thermal management for a gas turbine engine comprising the steps of: (1) deoxygenating a fuel in 16 to provide a deoxygenated fuel; (2) communicating the fuel 24 through a first liquid-to-liquid heat exchanger system

24 (page 2, paragraph 27 and paragraph 46) or alternately an upstream of the high temperature sources 22 (see end of paragraph 34) operable at a first maximum temperature; (3) communicating the deoxygenated fuel through a second liquid-to-liquid heat exchanger system 22 or a downstream of 22 (see end of paragraph 24) operable at a second maximum temperature, said second maximum temperature greater than said first maximum temperature; said step (2) further comprises the step of: communicating the deoxygenated fuel and an oil through the first liquid-to-liquid heat exchanger 24 or upstream one of 22, the oil effective above approximately 325 degrees Fahrenheit (note that it is inherent that if the fuel is getting as hot as up to 325 or even 900 F, then the oil transferring the heat to the fuel must be hotter than the fuel) and preventing the oil from exceeding approximately 325 degrees Fahrenheit (inherent, as the temperature of the fuel may be set lower than 325); communicating the oil through an oil loop in communication with a subsystem which can not exceed approximately 325 degrees Fahrenheit; wherein said step (3) further comprises the step of: communicating the deoxygenated fuel and an oil through the second liquid-to-liquid heat exchanger, the oil effective above approximately 325 degrees Fahrenheit and permitting the deoxygenated fuel to exceed 325 degrees Fahrenheit; communicating the deoxygenated fuel through a fuel pump 20 after said step (2); communicating the deoxygenated fuel from the first liquid-to-liquid heat exchanger to the second liquid-to-liquid heat exchanger; communicating the oil within the first loop with an aircraft generator subsystem (page 4, paragraph 46, teach generator heat loads are cooled and engine oil systems are

combinations thereof are cooled); communicating the oil within the first oil loop with an engine fan gear subsystem (page 4, paragraph 46 teach the fan drive gear system heat loads and engine oil systems and combinations thereof are cooled).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 11-17, 19-21, 23-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coffinberry (4,020,632) in view of either Sauer (6,604,558) or Spadaccini et al (6,315,815) and optionally in view of Mullin (4,879,052). Coffinberry teaches a method of thermal management for a gas turbine engine comprising the steps of: (1) providing a fuel 46; (2) communicating the fuel through a first liquid-to-liquid heat exchanger system 42 or 136 operable at a first maximum temperature; (3)

communicating the fuel through a second liquid-to-liquid heat exchanger system 80 or 138 operable at a second maximum temperature, said second maximum temperature greater than said first maximum temperature (these temperatures for 136 and 138 can be clearly seen in Fig. 9 for both the oil and the fuel); said step (2) further comprises the step of: communicating the fuel and an oil through the first liquid-to-liquid heat exchanger, the oil would appear to be effective above approximately 325 degrees Fahrenheit and preventing the oil from exceeding approximately 325 degrees Fahrenheit (see col. 8, lines 13-38); communicating the oil within the first loop with an engine fan gear subsystem 142 (see e.g. Fig. 6); communicating the oil through an oil loop in communication with a subsystem which can not exceed approximately 325 degrees Fahrenheit; communicating the deoxygenated fuel from the first liquid-to-liquid heat exchanger to the second liquid-to-liquid heat exchanger. Coffinberry does not teach the fuel is deoxygenated.

Sauer teaches using deoxygenated fuel for safety concerns by reducing the hazard of explosion (see abstract).Spadaccini et al teach using deoxygenated fuel to prevent fuel coking and allow the temperature of the fuel to reach high temperatures including temperatures of up to 700 °C (col. 3, lines 32+) and using the fuel in cooling systems in an aircraft (col. 6, lines 54+); the deoxygenator 110 deoxygenates the fuel prior to delivery to the heat exchanger 106 of the gas turbine engine. Note that these high temperatures will inherently require the heat exchanger fluid circulating in the heat exchanger to be higher than the fuel temperature for heat to be rejected thereto. It would have been obvious to one of ordinary skill in the art to employ deoxygenated fuel for

safety concerns and/or to prevent fuel coking and allow the temperature of the fuel to reach high temperatures. As for the oil being effective above 325 F, it is not clear whether the oil will still be effective at those temperatures. However, high temperature oil is old and well known in the art, as taught by Mullin even in the context of gas turbine engines (col. 2, lines 9+) with improved performance (col. 7, lines 26+ teach higher horsepower, and no cooling system malfunction) and as admitted as being commercially available as including NYCO Paris GTO 7. It would have been obvious to one of ordinary skill in the art to employ a high temperature oil for enhanced thermal protection and/or to prevent oil breakdown and/or improved performance and/or higher horsepower and/or preventing cooling system malfunction. As for allowing the fuel to exceed 325 in the second heat exchanger, this is fairly taught by Spadaccini who teaches allowing the fuel to reach temperatures above this range. It would have been obvious to one of ordinary skill in the art allow the fuel to exceed this temperature due to the enhanced anti-coking properties of the deoxygenated fuel. Note that operation of the fuel at higher temperatures, as taught by Spadaccini et al, e.g. above 325 will inherently require the high temperature oil to be above 325, because the oil rejects the heat to the fuel (compare with the Fig. 9 of Coffinberry et al and as would be known by any one of ordinary skill in the art).

7. Claims 11-17, 19-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coffinberry (4,020,632) in view of either Sauer (6,604,558) or Spadaccini et al (6,315,815) and optionally in view of Mullin (4,879,052), as applied above, and further in

view of Smith (6,182,435). Coffinberry teaches various aspects of the claimed invention including fuel cooling the engine fan gear subsystem but does not teach cooling the aircraft generator subsystem. Smith teaches that the fuel/oil heat exchangers used on aircraft are used to cool both electrical generators and the gearboxes (col. 1, lines 30+). It would have been obvious to one of ordinary skill in the art to cool an electrical generator with the fuel/oil heat exchanger as taught by Smith, in order to cool another unit on the aircraft that requires cooling.

8. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Coffinberry (4,020,632) in view of either Sauer (6,604,558) or Spadaccini et al (6,315,815) and optionally in view of Mullin (4,879,052), as applied above, and further in view of Niggemann et al (6,182,435). Coffinberry teaches various aspects of the claimed invention but do not teach the pump after the first heat exchanger. Niggemann et al teach a pump 156 following the first heat exchanger 124 and prior to the second heat exchanger 122 is old and well known in the art. It would have been obvious to one of ordinary skill in the art to employ the pump following the first heat exchanger as a well known location for the pump in such fuel systems.

9. Claims 11-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Spadaccini et al (6,315,815) and optionally in view of Mullin (4,879,052). The admitted prior art submitted in Fig. 1 of the 1.131 affidavit teaches a gas turbine engine comprising the steps of: communicating the fuel through a first liquid-to-liquid heat exchanger system (fuel cooled Gen. Oil Hex) operable at a first

maximum temperature; (3) communicating the fuel through a second liquid-to-liquid heat exchanger system (Fuel cooled Engine Oil Hex) downstream of the first heat exchanger operable at a second maximum temperature, said second maximum temperature greater than said first maximum temperature and the claimed pumps, (boost pump, MFP Centrifugal). The admitted prior art does not teach the use of deoxygenated fuels.

Spadaccini et al teach using deoxygenated fuel to prevent fuel coking and allow the temperature of the fuel to reach high temperatures including temperatures of up to 700 °C (col. 3, lines 32+) and using the fuel in cooling systems in an aircraft (col. 6, lines 54+); the deoxygenator 110 deoxygenates the fuel prior to delivery to the heat exchanger 106 of the gas turbine engine. Note that these high temperatures will inherently require the heat exchanger fluid circulating in the heat exchanger to be higher than the fuel temperature for heat to be rejected thereto. It would have been obvious to one of ordinary skill in the art to employ deoxygenated fuel for safety concerns and/or to prevent fuel coking and allow the temperature of the fuel to reach high temperatures. As for the oil being effective above 325 F, it is not clear whether the oil will still be effective at those temperatures. However, high temperature oil is old and well known in the art, as taught by Mullin even in the context of gas turbine engines (col. 2, lines 9+) and as admitted as being commercially available as including NYCO Paris GTO 7. It would have been obvious to one of ordinary skill in the art to employ a high temperature oil for enhanced thermal protection and/or to prevent oil breakdown. As for allowing the fuel to exceed 325 in the second heat exchanger, this is fairly taught by Spadaccini who teaches

allowing the fuel to reach temperatures above this range. It would have been obvious to one of ordinary skill in the art allow the fuel to exceed this temperature due to the enhanced anti-coking properties of the deoxygenated fuel. Note that operation of the fuel at higher temperatures, as taught b y Spadaccini et al, e.g. above 325 will inherently require the high temperature oil to be above 325, because the oil rejects the heat to the fuel (compare with the Fig. 9 of Coffinberry et al and as would be known by any one of ordinary skill in the art). The admitted prior art shown in the 1.131 affidavit does not teach the temperature of the 1st heat exchanger being less than 325. However, in the specification, this temperature range of being less than 325 for the 1st heat exchanger is regarded as being the conventional practice in the prior art (page 3, paragraph [19]. It would have been obvious to one of ordinary skill in the art to employ the 1st heat exchanger at less than 325 as the conventional/prior art practice employed in the art for low temperature cooling.

Response to Arguments

10. Applicant's arguments filed 07/31/2006 have been fully considered but they are not persuasive. Applicant's submission of the 1.131 affidavit to swear behind the Huang reference is ineffective. The affidavit does not convey that applicant had possession of the claimed ranges of temperatures above 325 F in terms of either conception or reduction to practice. The statement of diligence is insufficient as the applicants provide no evidence of diligence from the time of conception or from filing of their corporate internal disclosure statement to the filing of the patent application. In addition,

applicant's attorney does not provide any evidence of diligence from the time till the time of filing of the patent application. As applicant's affidavit is deficient, the rejections based on Huang remains outstanding.

11. In response to applicant's argument that Sauer is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the Sauer reference is directed to deoxygenating the fuels of the aircraft. Note that the gas turbine engines of the disclosure and the applied prior art are also used on aircraft (col. 1, circa 56 teaches the engine is used in flight). Applicant's argument is not persuasive as the field of endeavor is the same, the fuels used in the aircraft and gas turbines are the same field of endeavor.

12. Applicant also appears to miss the point of the Sauer reference. As at least the independent claims do not specifically require the deoxygenation occur **on** the aircraft, only that the fuel be deoxygenated prior to communication with the second heat exchanger. Sauer would teach filling the aircraft tank with deoxygenated fuel. As the timing of the deoxygenation is not claimed, Coffinberry operating with deoxygenated fuel in the fuel tank will meet the claimed limitations. Hence the features upon which applicant relies (i.e., deoxygenation occur **on** the aircraft) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations

from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

13. In response to applicant's argument that the examiner has combined an excessive number of references, reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

14. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax number for the organization where this application is assigned is 571-273-8300.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ehud Gartenberg, can be reached at 571-272-4828. Alternate inquiries to Technology Center 3700 can be made via 571-272-3700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at http://www.uspto.gov/main/patents.htm

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